Campus Bridging Use Case Quality Attribute Scenarios

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Table of Contents

List of Figures

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A. Document History

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Entire Document	1.00	05/08/2012	Baseline	Indiana University
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B. Document Scope

This document is both a user-facing document (publically accessible) and an internal working document intended to define quality attributes associated with user needs and use cases that fall under the general umbrella of Campus Bridging within the overall activities of XSEDE. The definition of quality attributes is based on a template from Malan and Bredemeyer[1]. In general it is in keeping with the approaches and philosophy outlined in "Software architecture in practice."[2]

This document is one component of a process that generates at least the following documents, some of which are user-facing, some are as of now intended to be internal working documents:

- A description of use cases [User facing]
- A binary mapping of use cases to Requirements in DOORS (a binary mapping means that for each use case a "yes" or "no" flag indicating whether a particular requirement within the full list of requirements is or is not required to enable a particular use case).
- A set of level 3 decomposition documents, which include:
    - ***This document*** - Quality Attributes descriptions [User facing]
    - Connections diagram in UML
- A paper to be submitted to XSEDE12 entitled "What is campus bridging, why should you care, and what is XSEDE doing about it?" that will be based in part on this document. That manuscript will include a restatement of use cases in the form of a set of seven five-year goals for XSEDE related to campus bridging.

The quality attributes are presented here using the following format, derived from the Malan and Bredemeyer white paper[1] as follows:

[1] Malan, R. and D. Bredemeyer. *Functional Requirements and Use Cases*. Architecture Resources for Enterprise Advantage. 2001. Available from: http://www.bredemeyer.com/pdf_files/functreq.pdf *f*

[2] Bass, L., P. Clements and R. Kazman. Software Architecture in Practice. Addison-Wesley, 2003. Available from: http://books.google.com/books?id=mdiIu8Kk1WMC

Scenario <Label> Title		
Scenario		
Attribute		
Attribute Concern		
Scenario Refinement	Stimulus	
	Stimulus Source	
	Environment	
	Artifact	
	Response	
	Response Measure	
Architectural Approaches		
Risks		
To Do		
Used Documentation		
Notes		
Result		

C. XSEDE QA scenarios for campus bridging use cases

QAS Id	Title	Attribute	Use case	I/D*
QAS-CB1.1	Binding InCommon identity to XSEDE identity	Performance	UCCB.1.0 InCommon-based authentication	H,H
QAS-CB1.2	Access to XSEDE resources after InCommon authentication	Security Ease of Use Performance	UCCB.1.0 InCommon – based authentication	H
QAS-CB2.1	Information about XSEDE cyberinfrastructure	Usability	UCCB 2.0 economies of scale in training and usability	M
QAS-CB2.2	Information about Campus cyberinfrastructure	Usability	UCCB 2.0 economies of scale in training and usability	M
QAS-CB2.3	Instructor publishing training materials	Usability	UCCB 2.0 economies of scale in training and usability	M
QAS-CB2.4	Instructor finding training materials	Usability	UCCB 2.0 economies of scale in training and usability	M
QAS-CB2.5	Learner finds and uses training materials	Usability	UCCB 2.0 economies of scale in training and usability	M
QAS-CB2.6	Create ROCKS Roll distribution	Interoperability	UCCB 2.0 economies of scale in training and usability	H
QAS-CB3.1	Installation of NX server	Deployability	UCCB 3.0 Long term remote interactive graphic session	M
QAS-CB3.2	User initiates an NX session	Performance	UCCB 3.0 Long term remote interactive graphic session	H
QAS-CB3.3	Keep NX session alive	Performance	UCCB 3.0 Long term remote interactive graphic session	H
QAS-CB4.1	Installation of access layer interface	Usability	UCCB 4.0 Use of data resources from campus on XSEDE, or from XSEDE at a campus	H
QAS-CB4.2	Intuitive GUI for file transfer	Usability	UCCB 4.0 Use of data resources from campus on XSEDE, or from XSEDE at a campus	H

QAS Id	Title	Attribute	Use case	I/D*
QAS-CB4.3	Successful automated recovery of transient failures	Availability	UCCB 4.0 Use of data resources from campus on XSEDE, or from XSEDE at a campus	H
QAS-CB4.4	Good file transfer efficiency	Performance	UCCB 4.0 Use of data resources from campus on XSEDE, or from XSEDE at a campus	H
QAS-CB5.1	Execute automated workflow without user intervention	Reliability	UCCB 5.0 Support for distributed workflows	M
QAS-CB5.2	Expired credentials while executing DAGMAN workflow	Reliability	UCCB 5.0 Support for distributed workflows	H
QAS-CB6.1	Enable campus resource for use with Shared Virtual Computational Facility (SVCF)	Extensibility	UCCB 6.0 Shared use of computational facilities	M
QAS-CB6.2	User configuration of an SVCF	Maintainability Extensibility	UCCB 6.0 Shared use of computational facilities	H
QAS-CB6.3	Provision SVCF for compliance with campus security	Maintainability Extensibility	UCCB 6.0 Shared use of computational facilities	H
QAS-CB7.1	Making commercial resources available	Interoperability	UCCB 7.0 Access to resources on a service-for-funds basis	H
QAS-CB7.2	Security incident on private resource	Security	UCCB 7.0 Access to resources on a service-for-funds basis	H
QAS-CB Prerequisite.1	Fast propagation of updates of tickets	Performance	UCCB Prerequisite XSEDE-wide unified trouble ticket handling	M
QAS-CB Prerequisite.2	Reliable propagation of updates of tickets	Reliability	UCCB Prerequisite XSEDE-wide unified trouble ticket handling	M

* This is the prioritization and difficulty estimation. I = importance – from the stakeholder community; D = difficulty – from the architects

D. UCCB.1.0 InCommon-based authentication

Scenario <QAS-CB1.1> Binding user InCommon identity to XSEDE identity		
Scenario	Before a user is able to use InCommon to authenticate with XSEDE resources, that user must go through an online process to bind their InCommon identity to their XSEDE identity, which should take at most 5 minutes.	
Attribute	Performance	
Attribute Concern	Enable access	
Scenario Refinement	Stimulus	User wants to use InCommon to authenticate with XSEDE and has not done so previously, so user needs to establish a binding between her/his InCommon identity and XSEDE identity. This is a one-time process.
	Stimulus Source	User
	Environment	User has an identity with an identity provider that is an InCommon federation member. User has an XSEDE identity.
	Artifact	XSEDE
	Response	XSEDE provides an online process for the user to bind their InCommon identity to their XSEDE identity.
	Response Measure	At most 5 minutes to complete binding.
Architectural Approaches		
Risks		
To Do		
Used Documentation		
Notes		
Result		

Scenario <QAS-CB1.2> Access to XSEDE resources after InCommon authentication		
Scenario	An XSEDE user is able to log in and access resources using the authentication process at their home institution (if an InCommon Federation member) or a 3rd party InCommon provider (if their home institution is not an InCommon Federation member). Once authentication is completed at the InCommon Identity Provider, activities that take place in XSEDE systems that allow access to resources will be completed in at most 5 seconds.	
Attribute	Security Ease of use Performance	
Attribute Concern	Security: use an authentication mechanism that has high standards and confidence Ease of use: Minimize number of different accounts a person has to manage Performance: Provide access quickly and reliably	
Scenario Refinement	Stimulus	User wishes to use XSEDE resources conveniently.
	Stimulus Source	User
	Environment	User has an identity with an identity provider that is an InCommon federation member.
	Artifact	XSEDE
	Response	XSEDE accepts the authentication and prepares the context to allow user appropriate access.
	Response Measure	At most 5 sec to complete authentication.
Architectural Approaches	Achievement of the security goal is implicit in the use of InCommon Federation standards; if an entity is a member of the InCommon Federation then they have satisfied the InCommon Federation of the quality of their security standards. The ease of use goal is also achieved at least in part implicitly. One identity to use (the identity at the InCommon Federation member) is simpler than one identity per service provider – or even one identity at the user's home institution and one at XSEDE.	
Risks		
To Do	Need to understand level of trust and ID/discuss with security team.	
Used Documentation		
Notes	Almost none of the prerequisites and assumptions are presently the case. Authentication is the responsibility of InCommon Identity Providers; the burden on XSEDE is to ensure validity and maintain the level of trust of the InCommon credentials and to provide authorization information that determines a user's level of access on XSEDE resources. In order to provide access to individuals not at InCommon Federation members, a person not at an InCommon member institution must be able to obtain credentials from a private provider in 48 hours or less. There are at least three options as of the writing of this document. ProtectNet provides identity access almost immediately. Docufide and Apple Computer are the only two Identity Providers listed by InCommon that are not educational institutions. The suggested catch-all is therefore ProtectNet.	

Result	

E. UCCB 2.0 Enable economies of scale in usability and training for XSEDE and campus resources through dissemination of information and tools

Scenario <QAS-CB2.1> Access to Information about XSEDE cyberinfrastructure		
Scenario	Make it easier for all users of local and XSEDE resources to find essential information about XSEDE computational, data, and visualization resources.	
Attribute	Usability	
Attribute Concern	User information	
Scenario Refinement	Stimulus	User searches for information about systems accessible as part of XSEDE.
	Stimulus Source	XSEDE user
	Environment	User has access to web browser and has enough information to know to go to xsede.org.
	Artifact	Xsede.org
	Response	User can easily find information about any XSEDE systems (*Level 1, 2, or 3) to which that user has or could have access, and information is always complete and in a consistent format, making it easy to compare systems and determine what system or systems best meet the user's needs.
	Response Measure	Information is always complete and accurate as of system configuration on the last business day before the user looks for information. The "click path" from xsede.org to the information the user wants is intuitive and takes no more than three clicks.
Architectural Approaches		
Risks		
To Do	There is a separate use case for another architectural area that has to do with real time monitoring and current system status information – this is more likely an operations metric. Reliability: 99.9% uptime for XSEDE web-based information. This metric should be consistent with other XSEDE web pages. This again is really an operations metric that flows from whatever the standards are for reliability during scheduled web site uptime and standards for scheduled downtime as well.	
Used Documentation		
Notes		
Result		

Scenario <QAS-CB2.2> Information about Campus cyberinfrastructure		
Scenario	Allow administrators of campus-based resources to easily present essential information about one or more campus-based computational, data, and visualization resources.	
Attribute	Usability	
Attribute Concern	Campus system information dissemination	
Scenario Refinement	Stimulus	A campus systems administrator wants to put information about a campus resource on the web in a format that matches the XSEDE format.
	Stimulus Source	Campus systems administrator
	Environment	Systems administrator has web servers, published web pages, etc., where s/he can publish information about campus resources.
	Artifact	Web pages containing information about campus resources, published within campus web hierarchies.
	Response	Campus system administrator obtains a HTML and MS word template from xsede.org web site and makes a web or print document for use locally.
	Response Measure	System administrator can find web page and document template easily (within 4 web clicks of xsede.org root level). If the system administrator can navigate to xsede.org, it should be possible to find relevant and available materials within ½ hour.
Architectural Approaches		
Risks		
To Do		
Used Documentation		
Notes	"System administrator" is used here in a very generic way to indicate anyone who is involved in administration and documentation of a system – not strictly confined to "a person who has root privileges"	
Result		

Scenario <QAS-CB2.3> Economies of scale in instruction: instructor publishing training materials	
Scenario	Make it easier for on-campus users to make use of XSEDE resources and find and use (as a teacher or a learner) training materials about XSEDE.
Attribute	Usability
Attribute Concern	Publishing of training materials

Scenario <QAS-CB2.3> Economies of scale in instruction: instructor publishing training materials		
Scenario Refinement	Stimulus	An instructor wants to put material online and let other people (their students or other people) use this material).
	Stimulus Source	Instructor (of any sort) wants to disseminate information.
	Environment	Basic: teacher has access to web browser and appropriate plugins, the person knows to start looking in xsede.org, and there is a place accessible and obvious linked from xsede.org where one can publish content. Proper licensing schemes are in place for modification and redistribution of materials. Advanced: teacher can get "class" or "educational" accounts on appropriate XSEDE systems so as to be able to do any hands-on exercises.
	Artifact	XSEDE Online training materials – one or more of the following: documents, presentations, video, audio. To the greatest extent possible educational materials are distributed with appropriate licenses (reusable and distributable with modifications and attribution – such as CC attribution 3.0 unported license) and in an editable format (which requires attribution but expressly does not permit the creator of a derivative work to imply it has the endorsement of the creator of the source work – see http://creativecommons.org/licenses/by/3.0).
	Response	Instructor is able to post their training materials online. Instructor is able to direct students and the community in general to training materials posted online.
	Response Measure	The response measure is specific to postings in an identified and recommended repository, and includes: The number of individual instructors who publish materials online. The number of full courses available online. The number of lectures available online.
Architectural Approaches		
Risks		

Scenario <QAS-CB2.3> Economies of scale in instruction: instructor publishing training materials	
To Do	Select a publishing mechanism. There are at least several good examples of mechanisms by which the goals outlined here can be accomplished in practice: HPC University (Shodor) http://hpcuniversity.org/ Connexions (Rice) - http://cnx.org/ NanoHUB and related HUBzero-based sites (Purdue)
Used Documentation	
Notes	Rice, Shodor, and Purdue are all XSEDE partners. Adoption of HUBzero-based sites would involve adding another major application/architecture to the overall mix. Leveraging HPC University (which right now does not have a subject category called "XSEDE") would seem a good strategy. We must use an expansive definition of "instructor" to clearly include "anyone who wishes to disseminate instruction and can do it well." YouTube is filled with good examples of students delivering excellent instruction.
Result	

Scenario <QAS-CB2.4> Economies of scale in instruction: instructor finding training materials		
Scenario	Make it easier for on-campus users to make use of XSEDE resources and find and use (as a teacher or a learner) training materials about XSEDE.	
Attribute	Usability	
Attribute Concern	Training materials for instructor	
Scenario Refinement	Stimulus	An instructor wants to find teaching materials about advanced computing and/or XSEDE resources (slides, reference materials, an example video of an experienced teacher using the materials, exercises and/or examination materials, and an answer key).
	Stimulus Source	Instructor wants to offer training about XSEDE.
	Environment	Basic: teacher has access to web browser and appropriate plugins, the person knows to start looking in xsede.org, and there is a place accessible and obvious linked from xsede.org that one can find the educational materials desired. Materials are licensed and presented in a way that permits re-usability (e.g. proper licensing and distribution as editable content, not as .pdf files). Advanced: teacher can get "class" or "educational" accounts on appropriate XSEDE systems so as to be able to do any hands-on exercises.

Scenario <QAS-CB2.4> Economies of scale in instruction: instructor finding training materials		
	Artifact	XSEDE
	Response	Teacher finds the material, and is able to use it as appropriate.
	Response Measure	Within 15 minutes of accessing xsede.org, instructor has found list of potential training materials to use. If appropriate materials are available for use, instructor is able to prepare for a 1-hour lecture in no more than 4 hours. Percentage of efforts to find usable training materials that result in success (instructor finds materials they want and are able to incorporate them into instruction). Number of MSIs and small colleges / universities that are able to offer seminars or credit courses in computational science and engineering as a result of availability of training materials. Number of students at MSIs and small colleges / universities that are able to offer seminars or credit courses in computational science and engineering as a result of availability of training materials.
Architectural Approaches		
Risks		
To Do		
Used Documentation		
Notes	Depends upon completion of Scenario <QAS-CB2.3> Economies of scale in instruction: instructor publishing training materials	
Result		

Scenario <QAS-CB2.5> Economies of scale in instruction: learner finds and uses training materials for independent learning in absence of a particular class or instructor		
Scenario	Make it easier for on-campus users to make use of XSEDE resources and find and use (as a teacher or a learner) training materials about XSEDE.	
Attribute	Usability	
Attribute Concern	Training materials for student independent learning	
Scenario Refinement	Stimulus	A learner wants to find materials they can use to learn about XSEDE generally, to perform a specific task.
	Stimulus Source	XSEDE user or potential user

Scenario <QAS-CB2.5> Economies of scale in instruction: learner finds and uses training materials for independent learning in absence of a particular class or instructor		
	Environment	Basic: learner has access to web browser and appropriate plugins, the person knows to start looking in xsede.org, and there is a place accessible and obvious linked from xsede.org that one can find the educational materials desired. Advanced: learner can get accounts on appropriate XSEDE systems so as to be able to do any hands-on exercises. Advanced: the training includes online self-testing materials so that the learner can verify that they have correctly learned the material and identify any areas they do not fully understand.
	Artifact	Better educated user who can understand a concept and do a task they want to perform without any human intervention by XSEDE staff.
	Response	Learner finds the material, and is able to use it as appropriate. If self-testing is available online, learner can verify that they have indeed understood the material properly.
	Response Measure	It should take no more than 30 minutes for a learner, starting from xsede.org, to identify a training class that addresses their learning objective. If online testing is included as part of the learning materials, feedback on whether or not the learner has mastered the material should be provided in real time. Number of students who access an online learning resource. For those materials that include self-testing, % of students who complete materials at MSIs and small colleges / universities that are able to offer seminars or credit courses in computational science and engineering as a result of availability of training materials.
Architectural Approaches		
Risks		
To Do		
Used Documentation		
Notes	Depends upon completion of Scenario <QAS-CB2.3> Economies of scale in instruction: instructor publishing training materials	
Result		

Scenario <QAS-CB2.6> Increase consistency of cluster setups US-wide by releasing a ROCKS Roll cluster distribution based on XSEDE cluster configuration		
Scenario	XSEDE should create a "ROCKS Roll" distribution that allows a campus-based sysadmin to install a cluster that includes the open source elements of a basic XSEDE cluster configuration using ROCKS.	
Attribute	Interoperability	
Attribute Concern	Build local clusters	
Scenario Refinement	Stimulus	A sysadmin decides to start using ROCKS to build a cluster that seems very much like a basic XSEDE cluster (for now this probably means "set up like Stampede").
	Stimulus Source	Campus leadership
	Environment	A sysadmin has a cluster that they have been administering with some existing tool – most likely other than ROCKS but perhaps ROCKS. Sysadmin has some sort of test environment locally to experiment with, or gets an allocation on FutureGrid to test within FutureGrid VMs. (Note: A sysadmin is unlikely to convert an existing cluster from one management tool to another. However a sysadmin might well use an XSEDE-developed distribution to set up a new cluster.)
	Artifact	ROCKS
	Response	Sysadmin reads the specific ROCKS Roll documentation available from XSEDE, perhaps also reads ROCKS documentation from ROCKS web site, downloads ROCKS, tries it out on a test cluster of FutureGrid, and then goes to work using XSEDE-distributed system documentation templates and ROCKS and builds new local cluster (or possibly rebuilds existing cluster). Hardware is correctly installed and functioning.

Scenario <QAS-CB2.6> Increase consistency of cluster setups US-wide by releasing a ROCKS Roll cluster distribution based on XSEDE cluster configuration		
	Response Measure	It takes less than 1 week for a competent sysadmin to understand ROCKS. It takes no more than two days for a sysadmin to learn how to do successful ROCKS implementations on a local test cluster or on FutureGrid, and cluster administrator on a campus can install a modest (up to 10 TFLOPS) cluster based on a "generic XSEDE cluster" with cluster build tools packaged by XSEDE. At least 90% of the users who have accounts on the local cluster and an XSEDE resource say that they are satisfied or more with the migration to the new cluster environment, and say that the new cluster environment makes it easier for them to use XSEDE. Sysadmin is as happy as sysadmins get, and declares that s/he has more time to work on issues that require local attention such as network tuning and file I/O.
Architectural Approaches		
Risks	There is clear dependency on ROCKS. Given the hundreds of clusters that use ROCKS (http://www.rocksclusters.org/) this seems a reasonable risk. XSEDE should monitor Open Science Grid's experience with RPM-based software distribution	
To Do		
Used Documentation		
Notes		
Result		

F. UCCB 3.0 Operation of a long term remote interactive graphic session

Scenario <QAS-CB3.1> Installation of NX server		
Scenario	Ability to install the NX server (http://www.nomachine.com/) by system administrators.	
Attribute	Deployability	
Attribute Concern	Installation NX server	
Scenario Refinement	Stimulus	A network administrator wants to install the NX server on a host machine at a given center/campus.
	Stimulus Source	Network administrator

Scenario <QAS-CB3.1> Installation of NX server		
	Environment	Licenses for NX server have been purchased by beforehand. Appropriately robust server machine at the center/campus (not central for many other XSEDE campus/center sites) that allows for at an appropriate number of parallel connections to be open (kept open) at the same time (at a large institution the number of sessions might be 100). X-Windows connections are configured. Access control rights are harmonized with XSEDE credentials to maintain single sign-on.
	Artifact	NX server
	Response	NX server present for each center/campus site in XSEDE configured to be used with X-Windows and SSH
	Response Measure	NX server may be installed properly and be usable in one day or less
Architectural Approaches		
Risks		
To Do		
Used Documentation		
Notes		
Result		

Scenario <QAS-CB3.2> User initiates an NX session		
Scenario	End user of XSEDE initiates an NX session with an XSEDE resource as a remote endpoint.	
Attribute	Performance	
Attribute Concern	Initiate NX session	
Scenario Refinement	Stimulus	XSEDE end-user opens a graphical session with a remote XSEDE center/campus site using the NX Client.
	Stimulus Source	XSEDE end-user
	Environment	Local campus has pre-installed NX clients accessible at the end-user's campus. End user knows how to access NX clients at her/his campus. End user has XSEDE credentials (known and accessible).
	Artifact	NX client / server

Scenario <QAS-CB3.2> User initiates an NX session		
	Response	User provides their XSEDE credentials through locally pre-installed NX clients. NX connection is open and X-Windows session can be started.
	Response Measure	As end-user of XSEDE that takes no longer than 2 minutes. Entering XSEDE credentials takes no more than 1 minute; creating remote NX connection to NX server takes no more than 1 minute, for overall maximum of 2 minutes to establish connection. End-user experiences a very good throughput of the connection.
Architectural Approaches		
Risks		
To Do		
Used Documentation		
Notes		
Result		

Scenario <QAS-CB3.3> Maintain NX session alive and restart work		
Scenario	Ability to specify how long (multiple days) a session should stay open and continue to use an active session in less than 30 seconds.	
Attribute	Performance	
Attribute Concern	Restart NX session	
Scenario Refinement	Stimulus	XSEDE end-user wants to continue using a NX session up to 3 days after it was opened.
	Stimulus Source	XSEDE end-user
	Environment	Every XSEDE user commits to the XSEDE-wide agreement and closes X-Windows connections when keeping NX connections open. User closed the X-Windows session per XSEDE-wide agreement and now wants to open the same connection and start using it. Locally pre-installed NX client that was specifically configured to keep connections for at least 3 days open. Assumes no maintenance on the server side during the same time period user is away.
	Artifact	NX client / server
	Response	User opens her/his connection and does not need to specify credentials again.

Scenario <QAS-CB3.3> Maintain NX session alive and restart work		
	Response Measure	At least in 99% of instances the NX-Client opens at appropriate place and way (understanding that work has happened during intervening time so screen display is unlikely in exactly same status as at time window was closed). The end-user experiences a very good throughput of the connection.
Architectural Approaches		
Risks		
To Do		
Used Documentation		
Notes	Operation procedures should be defined for the response to ensure the quality attributes work in this particular use case! Otherwise NX connections will not work and scale. Monitoring and control issues will be difficult to resolve.	
Result		

G. UCCB 4.0 Use of data resources from campus on XSEDE, or from XSEDE at a campus

Scenario <QAS-CB4.1> Installation of access layer interface for storage resources		
Scenario	User with XSEDE account, allocation and proper installation permissions installs or requests installation of an access layer interface to storage resources (that is, software that must be installed locally to access software on XSEDE resources).	
Attribute	Usability	
Attribute Concern	Ease of installation	
Scenario Refinement	Stimulus	User installs or requests installation of an access layer interface.
	Stimulus Source	End user
	Environment	User has an XSEDE account and allocation, and a campus account with an associated storage resource. User has proper installation permissions. User knows to look to the XSEDE portal/web site for assistance when necessary. Necessary software is installed and operational on the XSEDE Level 1 & 2 Service Providers resources.
	Artifact	Access layer interface

Scenario <QAS-CB4.1> Installation of access layer interface for storage resources		
	Response	Access layer interface is successfully installed.
	Response Measure	In < 1 working day the necessary software is installed on the user side.
Architectural Approaches		
Risks		
To Do		
Used Documentation		
Notes		
Result		

Scenario <QAS-CB4.2> Intuitive GUI for file transfer		
Scenario	Intuitive GUI for interactive initiation and management of file transfer between campus and XSEDE resources (Level 1 and 2).	
Attribute	Usability	
Attribute Concern	File access	
Scenario Refinement	Stimulus	User wants to move a file or a group of files from storage on a local resource to storage on an XSEDE Level 1 resource, utilizing an access layer interface.
	Stimulus Source	End user
	Environment	User has an XSEDE account and allocation, and a campus account with an associated storage resource. User knows to look to the XSEDE portal/web site for assistance when necessary. User has basic understanding of files and directories. Necessary software is installed and operational on the XSEDE Level 1 & 2 Service Providers resources. Campus connection to internet and firewall policies are in place to allow connection to storage resource and data transfer.
	Artifact	XSEDE
	Response	User is able to move file from local campus resource to XSEDE Level 1 and / or 2 resource; or from XSEDE Level 1 and / or 2 resource to local campus resource via access layer interface.

Scenario <QAS-CB4.2> Intuitive GUI for file transfer		
	Response Measure	It should take end user <=15 minutes to initiate a file copy without user support or documentation the first time, and <5 minutes for all subsequent copies. Interface should be at least as good as the GUI in Box.net or the Dilbert file transfer tool (http://www.dilbertfiles.com/).
Architectural Approaches		
Risks		
To Do		
Used Documentation		
Notes		
Result		

Scenario <QAS-CB4.3> Successful automated recovery of transient failures in file transfer process		
Scenario	For transient failures, the system should be able to restart a transfer and notify the user once the transfer has completed successfully.	
Attribute	Availability	
Attribute Concern	File access	
Scenario Refinement	Stimulus	A properly authenticated user accesses file or directory
	Stimulus Source	End user
	Environment	User has properly initiated a file transfer. An error condition occurs that prevents immediate access.
	Artifact	XSEDE
	Response	System recovers successfully or notifies end user that recovery was unsuccessful.
	Response Measure	At least 98% of user-initiated file transfers complete fully and successfully. If transfer does not complete as requested, user is notified within 5 minutes of the system's termination of attempts to restart.
Architectural Approaches		
Risks		
To Do		
Used Documentation		
Notes		

Scenario <QAS-CB4.3> Successful automated recovery of transient failures in file transfer process	
Result	

Scenario <QAS-CB4.4> Good file transfer efficiency		
Scenario	The combination of transfer efficiency and impact of failures and restarts provides efficiency that is at least as good as 50% of peak theoretically possible throughput of optimal network path and storage systems.	
Attribute	Performance	
Attribute Concern	Data transfer efficiency	
Scenario Refinement	Stimulus	User accesses files.
	Stimulus Source	End user
	Environment	Total size of all files must be >1 GB and average file size > 1 MB. Disk performance on both originating and receiving end of transfer have I/O capabilities that (in aggregate where appropriate) exceed the theoretical bandwidth of the lowest bandwidth segment of the network connection between source and target. Source and target systems are both within continental US.
	Artifact	Set of files
	Response	The files are transferred.
	Response Measure	Data transfer throughput is at least 50% of end-to-end theoretical peak throughput of optimal network path and storage system performance, measured on an otherwise idle network and otherwise idle storage systems on each end.
Architectural Approaches		
Risks		
To Do		
Used Documentation		
Notes		
Result		

H. UCCB 5.0 Support for distributed workflows spanning XSEDE and campus-based data, computational, and/or visualization resources

Scenario <QAS-CB5.1> Execute an automated workflow, possibly spanning XSEDE and campus cyberinfrastructure resources, without user intervention after workflow is initiated		
Scenario	A user wants to execute a workflow specified with an automated workflow system, using resources that may include XSEDE and campus (non-XSEDE) resources.	
Attribute	Reliability	
Attribute Concern	Probability that the workflow will complete without user intervention.	
Scenario Refinement	Stimulus	A host running workflow task fails causing the task to fail.
	Stimulus Source	The host fails.
	Environment	The workflow is specified in a language such as DAGMAN, and each DAGMAN task is correctly specified. There are sufficient resources are available to run the tasks even if one host fails. The user is properly authenticated before executing the workflow and the credentials are valid over the duration of the workflow. The user has sufficient allocations permission on resources to execute the workflow. There is sufficient disk space for jobs to execute.
	Artifact	A DAGMAN workflow engine
	Response	User expects the workflow to complete without their intervention. User might expect to be informed about the failure. Systems administrators may need to be notified about the failure.
	Response Measure	98% of workflows complete despite a host failing.
Architectural Approaches		
Risks		
To Do		
Used Documentation		
Notes		
Result		

Scenario <QAS-CB5.2> Expired credentials while executing DAGMAN workflow	
Scenario	A user wants to execute a workflow specified with DAGMAN.
Attribute	Reliability

Scenario <QAS-CB5.2> Expired credentials while executing DAGMAN workflow		
Attribute Concern	User or host credential expired	
Scenario Refinement	Stimulus	A credential times out during the execution of the workflow.
	Stimulus Source	Time passes.
	Environment	The workflow is specified in a language such as DAGMAN, and each DAGMAN task is correctly specified. There are sufficient resources are available to run the tasks even if one host fails. The user has sufficient allocations permission on resources to execute the workflow. There is sufficient disk space for jobs to execute.
	Artifact	A DAGMAN workflow engine
	Response	The user is given the opportunity to re-authenticate and continue executing the workflow. Tasks that were executing will be restarted: checkpoint/restart of the task is the programmer's responsibility.
	Response Measure	99.9% No completed work done so far is lost, i.e., data generated by completed tasks, the graph state (tasked completed so far).
Architectural Approaches		
Risks		
To Do		
Used Documentation		
Notes		
Result		

I. UCCB 6.0 Shared use of computational facilities mediated or facilitated by XSEDE

Scenario <QAS-CB6.1> Enable campus resource for use with Shared Virtual Computational Facility (SVCF)		
Scenario	Install the necessary software on a campus resource so that it can participate in Shared Virtual Compute Facility (SVCF) in no more than one business day.	
Attribute	Time and effort to deploy	
Attribute Concern	Set up of resource to participate in VOs	
Scenario	Stimulus	Request to use a campus resource as part of a VO.

Scenario <QAS-CB6.1> Enable campus resource for use with Shared Virtual Computational Facility (SVCF)		
Refinement	Stimulus Source	User or community that wants to include the resource into a VO.
	Environment	Campus resource is controlled by a load management system, e.g., PBS or SGE; a head node that meets minimum requirements (e.g. Linux, network, memory, etc.); installation staff (local sysadmins) have been properly trained in the software solution; exchange-rate for the campus resource.
	Artifact	Campus resource
	Response	Download/configure necessary software.
	Response Measure	Less than one business day.
Architectural Approaches		
Risks		
To Do		
Used Documentation		
Notes		
Result		

Scenario <QAS-CB6.2> User configuration of a Shared Virtual Compute Facility (SVCF)		
Scenario	Ability for a user or community to configure a Shared Virtual Compute Facility (SVCF), using resources that have already been appropriately enabled per previous scenario, in no more than one calendar day.	
Attribute	Configurability	
Attribute Concern	Create and configure a SVCF	
Scenario Refinement	Stimulus	User or community wants to create and configure a new SVCF, comprising a set of campus resources that have already been appropriate enabled, a set of users, and set of policies on usage.
	Stimulus Source	User or community that wants to create the SVCF
	Environment	Management software
	Artifact	SVCF
	Response	User able to create and configure SVCF.
	Response Measure	Less than one calendar day
Architectural Approaches		
Risks		
To Do		

Scenario <QAS-CB6.2> User configuration of a Shared Virtual Compute Facility (SVCF)	
Used Documentation	
Notes	
Result	

Scenario <QAS-CB6.3> Provision Shared Virtual Compute Facility (SVCF) for compliance with campus security processes		
Scenario	Ability to provision security at a campus resource for a SVCF in no more than one business day.	
Attribute	Configurability	
Attribute Concern	Time and effort to configure security on campus resource to accept SVCF requests	
Scenario Refinement	Stimulus	SVCF has been configured to use a campus resource.
	Stimulus Source	User or community that configured the SVCF
	Environment	A campus resource that has the necessary SVCF enablement software installed, per previous scenario. SVCF usage of the resource to occur using a new local identity, accessible by the SVCF identity.
	Artifact	
	Response	Campus resource is configured with appropriate local account and SVCF authentication to that account.
	Response Measure	In not more than 1 business day.
Architectural Approaches		
Risks		
To Do		
Used Documentation		
Notes		
Result		

J. UCCB 7.0 Access to private cyberinfrastructure resources on a service-for-funds basis (___ on demand)

Scenario < QAS-CB7.1> "Private Cyberinfrastructure Resource" provider makes commercial resources available		
Scenario	"Private resource" owner makes a resource available on demand in not more than a day. "Private resource" indicates a computational system that a campus or other local entity wants to make available to XSEDE users in return for compensation from those users.	
Attribute	Interoperability	
Attribute Concern	Availability of private resources	
Scenario Refinement	Stimulus	Request to make private resource available to community
	Stimulus Source	Private resource owner
	Environment	Capability kit is available to resource owner. Installation documentation and information is available to resource owner. Resource owner provides payment mechanism for cycles on demand.
	Artifact	Private resources
	Response	The resources become available to the community.
	Response Measure	In not more than one day
Architectural Approaches		
Risks		
To Do		
Used Documentation		
Notes		
Result		

Scenario < QAS-CB7.2> Security incident on private cyberinfrastructure resource		
Scenario	When a security incident happens on a private resource, XSEDE incident response evaluates and takes effective action if necessary within 24 hours of contact.	
Attribute	Security	
Attribute Concern	Private resource	
Scenario Refinement	Stimulus	Resource owner becomes aware of security incident on private resource.
	Stimulus Source	Resource owner

Scenario < QAS-CB7.2> Security incident on private cyberinfrastructure resource		
	Environment	Resource owner has information on how to contact XSEDE incident response.
	Artifact	Private resources
	Response	XSEDE incident response evaluates and takes effective action if necessary.
	Response Measure	Within 24 hours of contact
Architectural Approaches		
Risks		
To Do		
Used Documentation		
Notes		
Result		

K. UCCB CB Prerequisite XSEDE-wide unified trouble ticket handling

Scenario < QAS-CBPrerequisite.1> Fast propagation of updates of tickets		
Scenario	Propagation of updates to all relevant ticket systems happens in no more than 5 minutes.	
Attribute	Performance	
Attribute Concern	Ticket update	
Scenario Refinement	Stimulus	Help desk staff enters/updates/closes (resolves) a ticket in local SP ticket system or in the XSEDE ticket system.
	Stimulus Source	Help desk staff
	Environment	Help desk staff have necessary local SP account and XSEDE account with necessary authorization to open/update/close (resolve) help desk tickets in the local SP ticket system and the XSEDE ticket system.
	Artifact	XSEDE ticket system
	Response	Tickets and updates are propagated throughout XSEDE as appropriate, including propagation to XSEDE ticket. SP and XSEDE help desk staff can see the updated ticket.
	Response Measure	Performance: Propagation throughout all appropriate XSEDE and SP ticket systems should take place in less than 5 hours.
Architectural Approaches		
Risks		
To Do		
Used Documentation		
Notes		
Result		

Scenario < QAS-CBPrerequisite.2> Reliable propagation of updates of tickets		
Scenario	Propagation of updates to all relevant ticket systems is 99.9999% successful.	
Attribute	Reliability	
Attribute Concern	Ticket update	
Scenario Refinement	Stimulus	Help desk staff enters/updates/closes (resolves) a ticket in local SP ticket system or in the XSEDE ticket system.
	Stimulus Source	Help desk staff

Scenario < QAS-CBPrerequisite.2> Reliable propagation of updates of tickets		
	Environment	Help desk staff have necessary local SP account and XSEDE account with necessary authorization to open/update/close (resolve) help desk tickets in the local SP ticket system and the XSEDE ticket system.
	Artifact	XSEDE ticket system
	Response	Tickets and updates are propagated throughout XSEDE as appropriate, including propagation to XSEDE ticket. SP and XSEDE help desk staff can see the updated ticket.
	Response Measure	Reliability: Ticket creation/updates & propagation to other XSEDE ticket systems as appropriate must happen 99.9999% of the time.
Architectural Approaches		
Risks		
To Do		
Used Documentation		
Notes		
Result		